WHAT IS CLAIMED IS:

1. A monoclonal antibody comprising a monoclonal antibody having an ability to bind to an SCF receptor.

- 2. A monoclonal antibody according to claim 1 wherein said SCF receptor is a human SCF receptor.
- 3. A monoclonal antibody according to claim 2 wherein said monoclonal antibody is SR-1.
- 4. A monoclonal antibody according to claim 1 further comprising an ability to inhibit binding of a

 15 SCF molecule to said SCF receptor.
 - 5. A monoclonal antibody according to claim 4 wherein said SCF molecule is a human SCF molecule.
- 20 6. A monoclonal antibody according to claim 5 wherein said SCF receptor is a human SCF receptor.

- 7. A method of purifying hematopoietic cells comprising the steps of:
- (a) exposing a mixture of cells to a monoclonal antibody according to claim 1;
- (b) separating cells that bind to said monoclonal antibody from cells that do not bind to said monoclonal antibody.
- 8. A method of purifying hematopoietic cells

 10 according to claim 7 wherein said separating is by

 column chromatography.
 - 9. A method of purifying hematopoietic cells according to claim 7 wherein said separating is by fluorescence-activated cell sorting.
 - 10. A method of purifying hematopoietic cells according to claim 7 wherein said separating is by direct immune adherence.

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11. A method of reconstituting hematopoietic cells comprising bone marrow transplantation with hematopoietic cells purified according to the method of claim 7.

- 12. A method of gene therapy comprising retrovirally-mediated gene transfer into cells purified according to claim 7.
- 5 13. A method of separating normal cells from neoplastic leukemia cells comprising the steps of:
 - (a) exposing a mixture of cells comprising normal cells and neoplastic leukemia cells to a monoclonal antibody according to claim 1;
 - (b) separating normal cells from neoplastic leukemia cells based upon a differential in numbers of SCF receptors on normal cells and neoplastic leukemia cells.
- 14. A method of treating leukemia cells comprising administration of a therapeutically effective amount of a leukemia therapeutic agent conjugated to a monoclonal antibody according to claim 1.
- 20 15. A method of treating leukemia cells comprising administration of a therapeutically effective amount of a leukemia therapeutic agent conjugated to a binding fragment of a monoclonal antibody according to claim 1.

16. A method of treating solid tumors comprising administration of a therapeutically effective amount of a solid tumor therapeutic agent conjugated to a monoclonal antibody according to claim 1.

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- 17. A method of treating solid tumors comprising administration of a therapeutically effective amount of a solid tumor therapeutic agent conjugated to a binding fragment of a monoclonal antibody according to claim 1.
- 18. A method of determining the presence of SCF receptors in a cell sample comprising the steps of:
 - (a) exposing a cell sample to a
- 15 monoclonal antibody according to claim 1;
 - (b) detecting the binding of said monoclonal antibody to SCF receptors.
- 19. A method according to claim 18 wherein 20 said detecting is accomplished by using a labelled monoclonal antibody.
- 20. A method according to claim 18 wherein said cell sample is selected from the group consisting of normal cells, leukemia cells and solid tumor cells.

21. A method of modifying sensitivity to cell cycle-specific chemotherapeutic agents comprising administration of a SCF inhibiting amount of a monoclonal antibody according to claim 1.

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- 22. A monoclonal antibody according to claim 1 wherein said monoclonal antibody is a murine-human hybrid antibody.
- 23. A monoclonal antibody according to claim
 1 wherein said antibody is of the IgG2a isotype.
 - 24. A hybridoma capable of producing a monoclonal antibody according to claim 1.

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25. A hybridoma according to claim 24 wherein said hybridomas is capable of producing the monoclonal antibody SR-1.

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